Unit 3 (Climate Change) Test

K / 19
T / 7
C / 11
A / 19

Name: Answers

Total / 56

True/False – Circle "T" if the statement is true; circle "F" is the statement is false.

T (F) Thanks to fossil fuel use, carbon dioxide is now one of the three most plentiful gases in the atmosphere

(T) F Oceans are becoming increasingly acidic as carbon dioxide dissolves in them

T (F) Scientists are working on a plan to make cars that directly use algae for fuel. Just pour the algae in your gas tank.

7 K (T) F Pumping SO_2 into the stratosphere could help to temporarily lower the temperature of the Earth

(T) F Global warming contributes to stronger hurricanes

T (F) The Kyoto Accord was designed to reduce chlorofluorocarbon use

T (F) Carbon dioxide has the greatest GWP (Global Warming Potential) of all gases we know

Definitions – Define each of the following terms.

8 K

Climatograph	Graph showing temp, precip in one place over a year
IPCC	Intergovernmental Panel on Climate Change
Anthropogenic	Human-caused
Climate Model	A computer program used to predict climate
Eccentricity	Oval-ness of orbit High eccentricity ⇒ oval Low eccentricity ⇒ circular
Chlorofluorocarbon	Refrigerant that depletes ozone in the stratosphere
La Nina	South Pacific ocean surface temp 0.5°C lower than usual
Montreal Protocol	Agreement to ban certain chlorofluorocarbons

Short Answer – Each is worth two marks ... make sure you include two valid points to get full marks.

1. Name two methods that scientists use to discover what climate *used* to be like?

- ice cores
- tree rings
- sedimentary rock analysis

2 K

2. Name one (scientifically legitimate) possible cause of global warming, and how it is causing the Earth to warm.

Fossil fuel burning releases CO_2, which traps heat in atmosphere

2 K

3. Other than height in the atmosphere, distinguish between **tropospheric ozone** and **stratospheric ozone**.

ozone layer: protects us from UV light

ground-level: dangerous pollutant; contributes to smog

2 C

4. Give an example of a **positive** feedback loop, relating to climate.

2 C

5. Give an example of a **negative** feedback loop, relating to climate.

2 C

6. Answer the following questions about the **albedo effect**.

a) What is **albedo**? Reflectivity

b) How does less ice coverage on Earth affect the Earth's albedo?

less ice ⇒ lower albedo

3 A

c) How does less ice coverage on Earth affect the Earth's climate?

less ice ⇒ lower albedo ⇒ less light reflected
⇒ more light absorbed
⇒ warmer Earth

7.

a) What is a person's **carbon footprint**?

How much CO_2 is released in the processes needed to sustain one's lifestyle

3 A b) How could you *decrease* YOUR carbon footprint?

- Drive less
- Recycle
- Eat less meat
- Use less electricity

c) How does **carbon sequestration** work?

Take CO_2 out of atmosphere, store it somewhere (underground?)

8. Give two points **supporting** action on climate change, and two points **opposing** action.

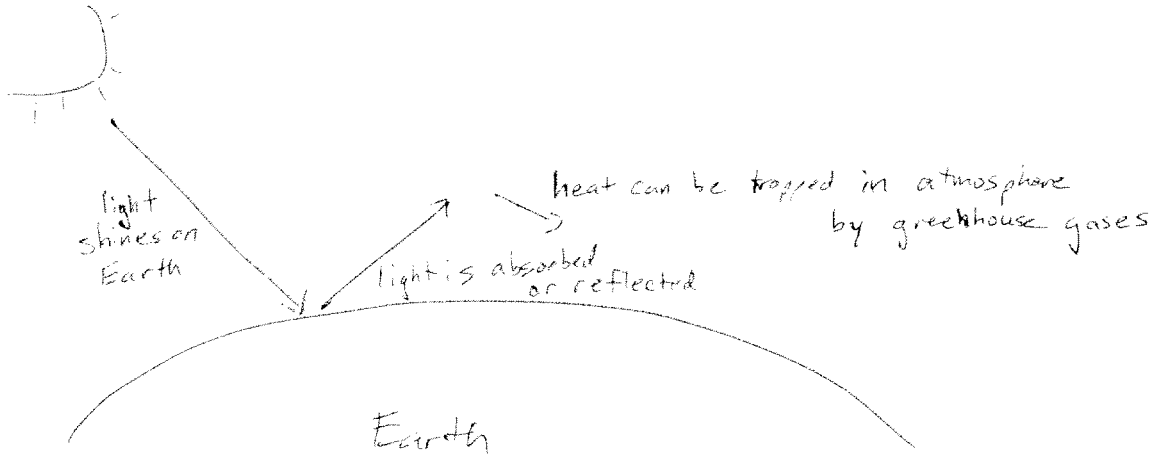
Reasons we **should act**	Reasons we **should wait before taking action**

4 T

Longer Answers – Look at how much each question is worth ... include that many pieces of information.

9. How does the greenhouse effect keep the Earth warm? You may use a diagram to help you explain.

3 C

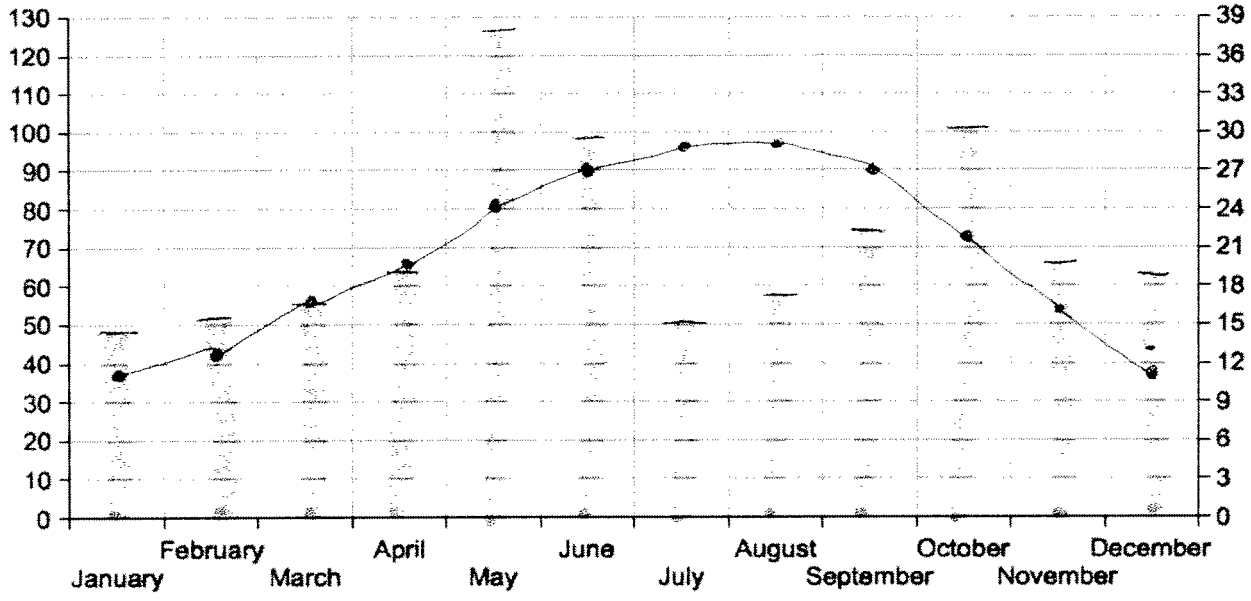


10. Create a climatograph out of the following data, using the grid provided.

Average Climate Data for Austin, TX

Time (month)	Precipitation (mm)	Temperature (°C)
January	48.0	10.0
February	50.5	13.0
March	54.4	17.0
April	63.8	20.0
May	127.8	24.0
June	96.8	27.0
July	50.0	29.0
August	58.7	29.0
September	73.9	27.0
October	100.8	22.0
November	68.1	16.0
December	62.0	11.0

4 A



11. Weather-wise, what's the difference between El Nino and La Nina? Explain how each affects the climate of Canada.

3 A

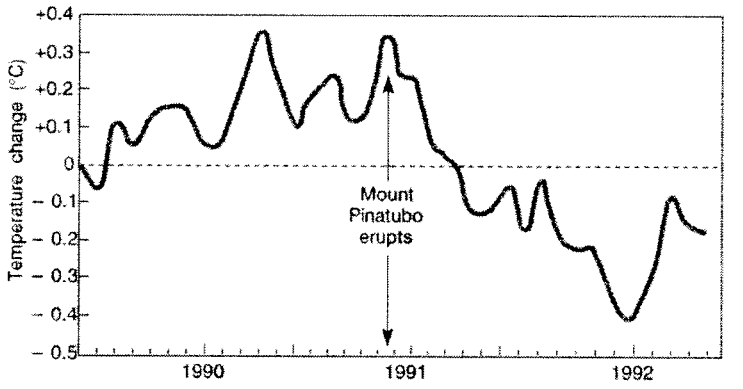
0.5° Warmer Ocean surface

Warmer, wetter air entering Canada

0.5° cooler ocean surface

Cooler, drier air entering Canada

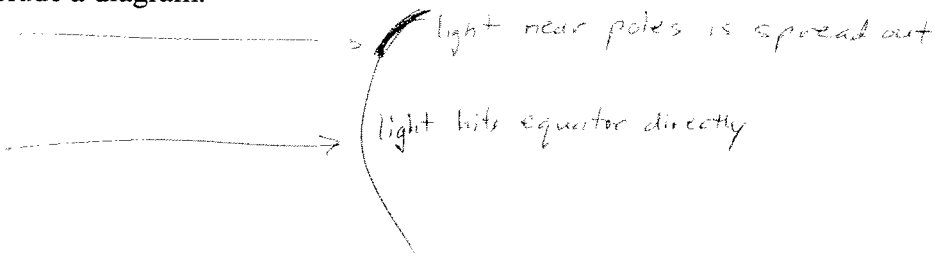
12. In 1991, Mount Pinatubo (a large volcano) erupted. Temperatures dropped by about a degree across the entire globe (see graph at right). Explain how a volcanic eruption in one place can change the temperatures across the entire globe.



2 C

Ash cloud blocks sunlight → less light → less warming → cooler Earth

13. How does a country's latitude affect climate? Put another way, why is it colder at the poles than at the equator? You may want to include a diagram.



2 A

14. How does Earth's tilt affect climate? Put another way, why is it cold in December in Canada, but warm in December in Australia?

2 A

When top is tilted toward sun, North has summer.

When top is tilted away from sun, North has winter

15. Explain how **geo-engineering** could be used to control climate. Be sure to include an example of possible geo-engineering we could do.

Controlling how much light enters/leaves Earth

→ Could block sun with
- SO_2 ash cloud
- mirrors in space
- mirrors on roof

2 A

16. Fox News once ran a segment showing a snowstorm, and presented it as evidence that global warming isn't happening.

Explain the difference between **climate** and **weather** to refute this claim.

3 T

Weather → short term
Climate → long term

A snowstorm (weather) isn't indicative of warming trend (climate)